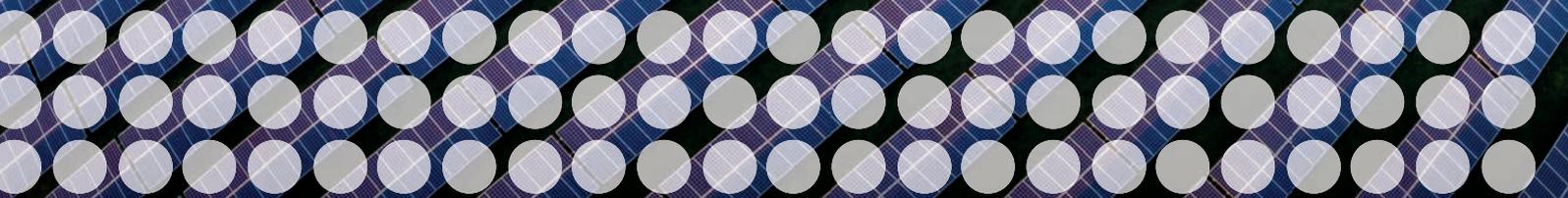
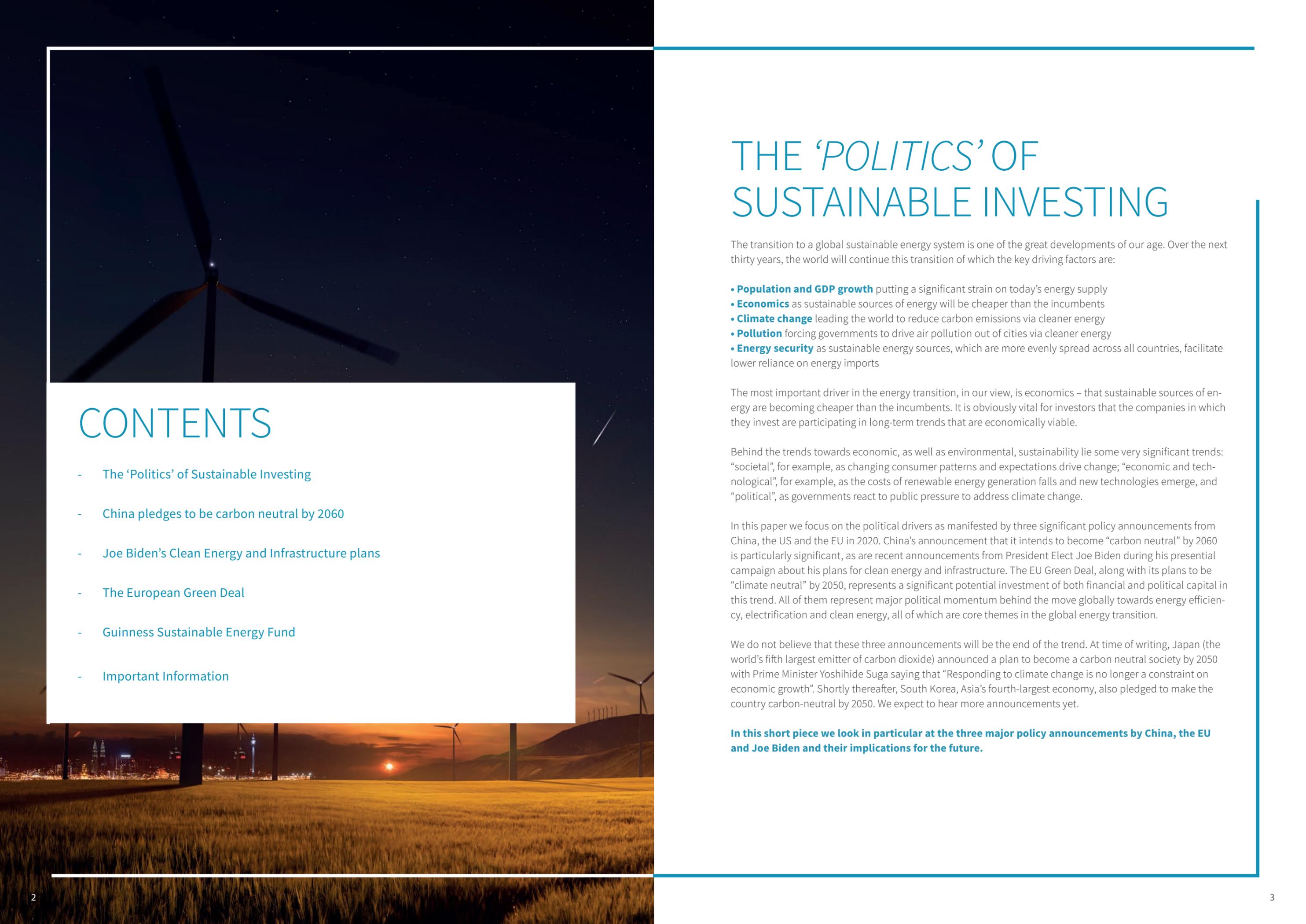


The 'Politics' of Sustainable Investing

Will Riley, CA (Portfolio Manager)
Jonathan Waghorn (Portfolio Manager)
Jamie Rosser , CFA, CAIA (Analyst)





CONTENTS

- The ‘Politics’ of Sustainable Investing
- China pledges to be carbon neutral by 2060
- Joe Biden’s Clean Energy and Infrastructure plans
- The European Green Deal
- Guinness Sustainable Energy Fund
- Important Information

THE ‘POLITICS’ OF SUSTAINABLE INVESTING

The transition to a global sustainable energy system is one of the great developments of our age. Over the next thirty years, the world will continue this transition of which the key driving factors are:

- **Population and GDP growth** putting a significant strain on today’s energy supply
- **Economics** as sustainable sources of energy will be cheaper than the incumbents
- **Climate change** leading the world to reduce carbon emissions via cleaner energy
- **Pollution** forcing governments to drive air pollution out of cities via cleaner energy
- **Energy security** as sustainable energy sources, which are more evenly spread across all countries, facilitate lower reliance on energy imports

The most important driver in the energy transition, in our view, is economics – that sustainable sources of energy are becoming cheaper than the incumbents. It is obviously vital for investors that the companies in which they invest are participating in long-term trends that are economically viable.

Behind the trends towards economic, as well as environmental, sustainability lie some very significant trends: “societal”, for example, as changing consumer patterns and expectations drive change; “economic and technological”, for example, as the costs of renewable energy generation falls and new technologies emerge, and “political”, as governments react to public pressure to address climate change.

In this paper we focus on the political drivers as manifested by three significant policy announcements from China, the US and the EU in 2020. China’s announcement that it intends to become “carbon neutral” by 2060 is particularly significant, as are recent announcements from President Elect Joe Biden during his presentational campaign about his plans for clean energy and infrastructure. The EU Green Deal, along with its plans to be “climate neutral” by 2050, represents a significant potential investment of both financial and political capital in this trend. All of them represent major political momentum behind the move globally towards energy efficiency, electrification and clean energy, all of which are core themes in the global energy transition.

We do not believe that these three announcements will be the end of the trend. At time of writing, Japan (the world’s fifth largest emitter of carbon dioxide) announced a plan to become a carbon neutral society by 2050 with Prime Minister Yoshihide Suga saying that “Responding to climate change is no longer a constraint on economic growth”. Shortly thereafter, South Korea, Asia’s fourth-largest economy, also pledged to make the country carbon-neutral by 2050. We expect to hear more announcements yet.

In this short piece we look in particular at the three major policy announcements by China, the EU and Joe Biden and their implications for the future.

CHINA PLEDGES TO BE CARBON NEUTRAL BY 2060

China has recently announced plans to become carbon neutral in 2060, in what appears to be a preface to its upcoming 14th five-year plan. We assess the rationale, targets and implications of this shift in policy and conclude that China's ambition provides a significant confirmation of the long-term economic attractiveness of renewable power generation and energy efficiency.

Background to China's emissions and policy

China is the world's largest emitter of CO₂, representing 28% of total global CO₂ emissions. Its ambition to become carbon neutral by 2060 places it close to the EU (which targets zero emissions by 2050) and further contrasts its position with the USA, which now becomes the largest emitter in the world that does not have a plan to become carbon neutral. This is not China's first target on emissions. Back in 2014, China announced that its emissions would peak in 2030 and this target still remains today.

Besides the geopolitical motivations, we believe that China has good reasons to reduce emissions and fight climate change. The Chinese urban population has long suffered from air pollution issues and more recently from catastrophic flooding in the central Yangtze River Basin. Looking further ahead, we note that a number of Chinese coastal cities, for example Shanghai, are at risk of rising sea levels.

Details of the new policy were presented in a webinar by Tsinghua University's Institute of Energy, Environment and Economy. The Ministry of Ecology and Environment has worked closely with the institute on projecting long term goals and it also works with a separate climate research institute at Tsinghua run by Xie Zhenhua, who led China's climate policies and represented the country in international climate negotiations for more than 10 years. We believe that the report prefaces some of the new policy that will be included in the Fourteenth Five Year Plan (14FYP) which is likely to be announced in 4Q 2020 and will cover 2021 to 2025. This FYP will be the first to have zero subsidy for renewable energy developments and hence its clean energy ambitions will not be limited by subsidy budget availability.

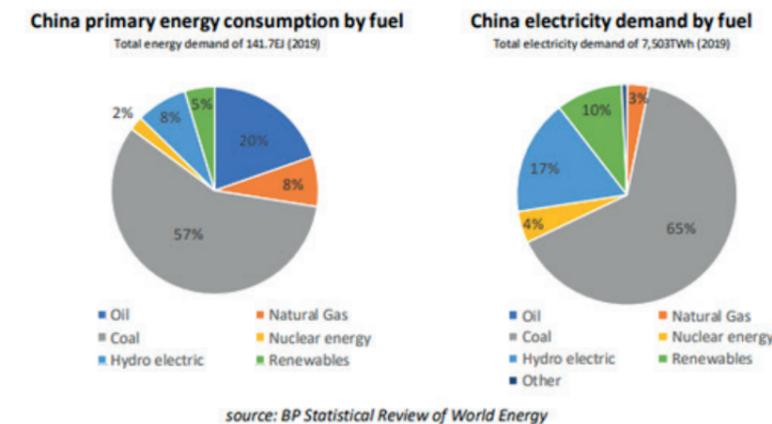
Key targets and benchmarks from the new report

In big picture terms, the report envisages a gradual transition over the next 15 years, with a rapid acceleration in decarbonisation after 2035. Specific targets are:

- Energy demand will peak around 2035 at 6-6.5bn tons of coal equivalent (versus current energy demand of around 4.8bn tons of coal equivalent)
- Electricity will make up 80% of total energy consumption by 2060 (versus its current share of 19%)
- Coal-fired power will be phased out around 2050 (from its current level of around 65%)
- The share of non-fossil fuels in total energy demand will grow from c15% in 2019 to 20% by 2025, 24% in 2030, 62% in 2050, and 84% in 2060
- Carbon emissions are projected to rise to c9.6bn tons in 2025 before peaking at 10.2bn tons in 2030. They are then planned to fall to c9bn tons in 2035 before declining dramatically to 3bn pa by 2050, 900m by 2055 and 200m by 2060.

Implications for the key components of Chinese energy supply and demand

China's energy demand was satisfied 85% by fossil fuels in 2019, leaving the energy industry as the biggest source of emissions. Within this, coal represented 57%, oil was 20% and natural gas was only 8% with the non-fossil sources of biofuel, hydro, solar, wind and nuclear each providing between 2% and 8%.



• **Coal's** share of power generation (currently at 65%) is in decline after peaking at 82% in 2009; over the same period, coal generation has actually increased by 51% due to increased electricity demand. As of June 2020, China was approving new coal plant capacity at the fastest rate since 2015 and new capacity added in 2020 was expected to exceed 40GW (comparable in size to the 2030 projections for the UK offshore wind power generation market or the EU hydrogen industry). The elimination of coal power by 2050 would call into question the economic viability of all these new and yet to be built plants, which typically have 30 year lives.

• **Solar and wind** already have a levelized cost of electricity generation that is lower than new coal in China and soon, in our opinion, it will be cheaper to build new wind and solar than it is to run existing coal plants. The 2060 net neutral ambition implies that solar power capacity will increase around twelvefold from current levels while wind power generation will increase around eightfold. In the near term, bottlenecks exist in accessing the grid and finding sites with sufficient solar or wind resource to make subsidy-free solar/wind power projects economic.

We believe that solar is more advantaged because solar projects can be built in a more distributed manner and the main solar resources are located close to key consumption areas in the south east of the country. In contrast, the wind resource is mainly in the less inhabited north and west of the country and the high voltage grid infrastructure has not yet been built to enable cross-country connection of this scale.

• **Nuclear** remains an important source of low carbon baseload power generation for China and between 2019 and 2060, nuclear generation is likely to quadruple.

• **Industrial demand** will be challenging to decarbonise. The manufacturing of chemicals, cement and steel and non-ferrous metals (aluminium and copper for example) accounts for about 90% of all industrial energy consumption. While switching from coal to natural gas has reduced industrial emissions over the last few years, China will need to do a lot more. Approaches such as recycling and the use of hydrogen, biofuels and bioplastics will be important here while large scale carbon capture storage and utilisation (CCUS) will be necessary in order to mitigate the remaining CO₂ emissions.

• **Transport:** China is already the largest market in the world for battery electric vehicles (2-wheelers, cars and buses) and it also has the largest fuel cell commercial vehicle / bus fleet in the world. However, the 2.6mn EVs on the road in China at the end of 2019 is still very small compared to the estimated 255mn internal combustion engine vehicles on the road. China will have to accelerate EV and fuel cell deployment (especially for heavy duty and commercial vehicles) with the associated rapid build out of battery manufacturing.

Other factors that need to be considered

This report appears to be a blueprint for the generation (supply) side of China's energy industry. If China is to be successful in meeting its broader carbon goals it will have to further embrace energy efficiency, consider the reduction of other non-energy greenhouse gas emissions and clarify its approach to carbon offsets and exclusions.

- China initiated its first **energy efficiency** targets in the 11th Five-Year Plan (2006-10), with projects such as the upgrading of inefficient coal-fired industrial boilers and furnaces, regional cogeneration projects, energy-efficient buildings, green lighting projects and energy-saving monitoring and technology service system construction. We expect more on the topic of energy efficiency when the FYP is published. China has made huge strides in energy efficiency over the last decade and we see it is an exemplary case for energy efficiency's numerous benefits. IEA analysis shows that without energy efficiency gains since 2000, China would have used 20% more energy in 2018 meaning that emissions of around 2.1 Gt of CO2 equivalent have been prevented – almost two thirds of those of the European Union (EU-28).

While energy is responsible for the largest share of China's carbon emissions, we expect that the FYP will have to address climate neutrality (considering all greenhouse gas emissions, including methane) as well as carbon neutrality. We would also expect to see more detail on how China will treat offsets (from within or outside of the country), how agriculture emissions will be accounted for and where various sectors might be provided with exemptions.

Summary

We see China's new 2060 carbon neutrality target as a further external confirmation of the attractive economics of a dramatic growth in renewable power generation and (although not detailed in this specific report) a continued focus on energy efficiency measures. We expect the 14 FYP to provide a broader range of targets and further detail around the topic and are confident that the steps will be supportive of the sustainable energy theme on a long-term basis.

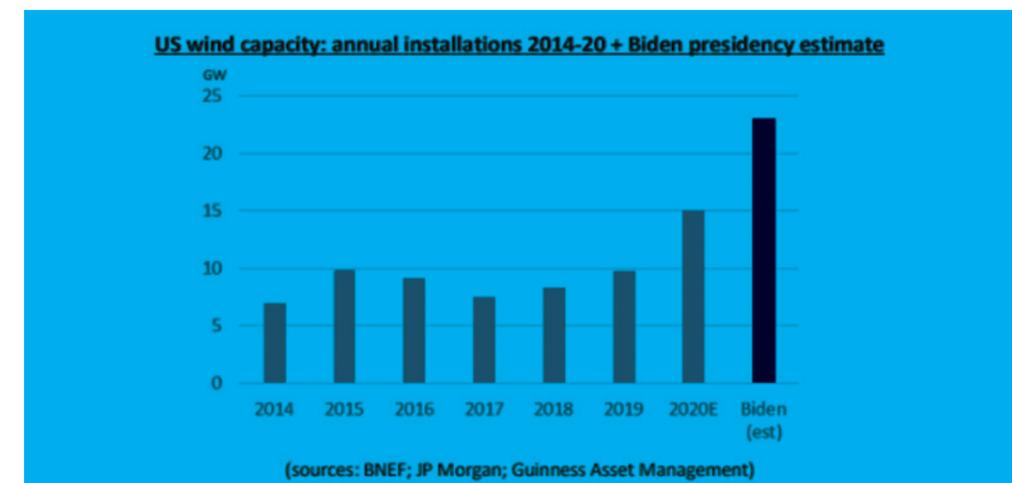


JOE BIDEN'S CLEAN ENERGY AND INFRASTRUCTURE PLANS

In his presidential campaign, Joe Biden promised a significant change in US policy toward sustainable energy and its associated infrastructure. Biden released his infrastructure and clean energy plans in July, describing them as an opportunity for America to become “the world's clean energy superpower”. Initial plans announced by Biden earlier in the summer called for \$1.7trn spending on clean energy over 10 years. The more detailed climate and clean energy manifesto published in July promotes a far higher level of spending, up to \$2trn over just four years. His key aims include:

- 1) **A focus on clean power generation.** Biden is targeting carbon free power generation in the US by 2035. This would be achieved by scaling up best practices from state-level clean energy standards. It would involve a major ramp-up in solar generating capacity – including utility-scale, rooftop and community scale systems, as well as a ramp-up in wind installations, onshore and offshore. This would need to be accompanied by a major upgrade of transmission and distribution lines, with a ‘re-powering’ of existing lines with new technology being a priority. JP Morgan estimate that annual wind installations in the US might increase to around 22-23GW per year under the Biden plan, which compares to 15GW expected to be installed in 2020.

Example beneficiaries in the Guinness sustainable energy portfolio: i) **Enphase and Solaredge:** solar PV inverter manufacturers, with focus on the expansion of US residential solar; ii) **Vestas:** Number 1 US onshore wind company; iii) **Siemens Gamesa:** Number 3 player in the US wind market, with growing offshore backlog.



2) **Energy upgrades to buildings.** Biden plans an unprecedented level of investment towards upgrading the energy efficiency of homes, offices, warehouses and public buildings. The plan includes an upgrade to around 4m commercial buildings, and would coincide with the creation of at least 1m construction, engineering and manufacturing jobs. The energy upgrades would include installation and maintenance of high-efficiency LED lighting, electric appliances, and advanced heating and cooling systems that operate more efficiently. At the residential level, incentives will be made available to households across the US to electrify home appliances and install energy efficient windows. There will also be an effort to establish new building standards for existing real estate nationwide, and together with a net-zero emissions standard for all new commercial buildings by 2030, would contribute to a targeted halving of the carbon footprint of buildings by 2035.

Example beneficiaries in the Guinness sustainable energy portfolio: i) **Ameresco:** leader in the management of energy efficiency building projects in the US, especially in the government sector; ii) **Schneider Electric:** leading player in building automation and building efficiency solutions.

3) **Electrification of road transportation.** One of Biden's key ambitions is to accelerate the deployment of electric vehicles across the US. This would involve not only the sale of more EVs but also an acceleration of the development of EVs in the US to reduce China's lead in the industry. The focus here would include support for EV component suppliers, as well as original equipment manufacturers (OEMs). In addition, there would be a major federal commitment to purchase clean vehicles for federal, state and local government transport fleets. A key sticking point for the penetration of EVs is the availability of charging points, and Biden plans to address this via investment into 500,000 new EV charging stations across the country. This compares to a current installed base of less than 100,000 charging stations. Biden also wants all new buses to be zero emissions by 2030 and to convert 500,000 existing school buses to zero emissions. The federal transportation fleet runs around 3m vehicles, representing just over 1% of the registered auto fleet in the US, so a push here would be useful but dwarfed by the need to incentive private take-up of EVs, for a clean auto plan to be successful.

THE EUROPEAN GREEN DEAL



The overarching aim of the European Green Deal is to make Europe climate neutral in 2050 with mid term targets for a 50-55% reduction in emissions (versus 1990 levels) by 2030. The president of the European Commission, Ursula von der Leyen, stated that the European Green Deal would be Europe's "man on the Moon moment", as the plan would make Europe the first climate-neutral continent. The set of policy initiatives has been mooted for a number of years and full details were made available last month.

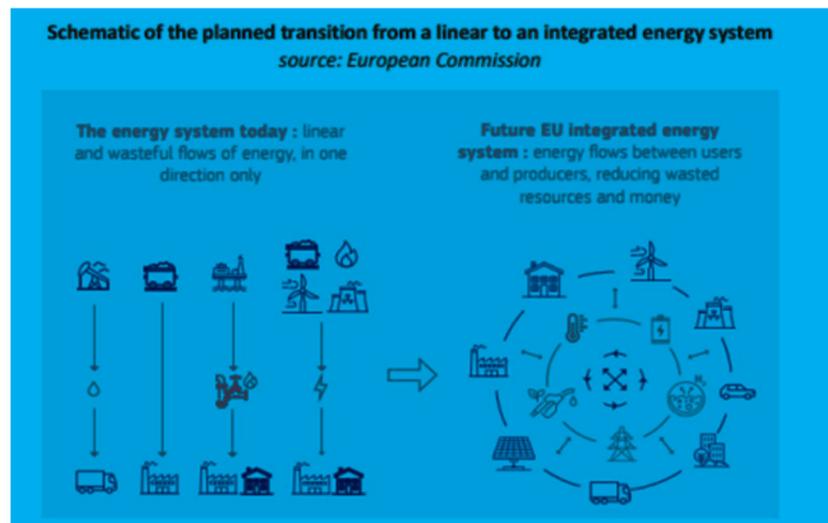
The strategy is designed to profoundly reform the European energy system. According to EU documentation: "We are designing a more efficient and integrated system that links energy sources and infrastructure to support decarbonisation and build a climate neutral EU by 2050. It will help to build modern infrastructure, make European industry more sustainable and competitive, create jobs, and provide clean energy for citizens."

In our view, the four main characteristics are:

- **A more efficient and "circular" energy system.** The focus here is very much on energy efficiency and ensuring that every component of the energy system is fully utilised. For example, incentivising the re-use of waste heat from industrial sites and data centres and the use of agriculture residues to produce sustainable biogas and biofuels.
- **Greater generation of renewable power.** As well as generating more renewable power, the focus is also on increasing the use of renewable electricity in buildings, transport and industry for instance through heat pumps, electric vehicles and furnaces. Key infrastructure efforts here include rapid growth in the development of charging stations for electric vehicles.
- **Promotion of renewable and low-carbon fuels.** The focus here is on de-carbonising sectors and industries that are deemed to be 'hard to de-carbonise' via renewable power generation. Examples include heavy transport and industry (such as steel manufacturing) where low carbon fuels and green hydrogen could play a role. This will require development of sustainable biomass and biofuels, synthetic fuels and economic CCS (carbon capture & storage) opportunities.

• **Adapt to an integrated energy system.** This, we think, is the most forward-thinking proposal and requires energy markets, infrastructure and regulation to adapt in order to allow energy consumers and investors to choose the option that best matches their need, based on prices that reflect the true cost (economic and carbon-related) of the energy source and the efficiency of its consumption. This will be partly fulfilled via infrastructure such as the smart grid and smart meters but also via EU wide regulation and taxation.

The investment associated with the EU Green Deal between 2020 and 2050 is estimated to be around Eur7trn, with around Eur4trn being publicly sourced and around Eur3trn being largely privately funded. The financing requirement appears to be evenly spread across the period, with around Eur1trn of financing required in the first ten years. According to Goldman Sachs, this run-rate of investment is around double the current 2020-2050 annual infrastructure capex spend of the European utility industry of Eur75bn pa with the greatest increases relative to existing plans occurring in the earlier years of the plan. The scale is significant.



The longer-term outlook for the Energy Transition

We think it likely that government incentivized investments and targets within sustainable energy, such as those announced by China, President Elect Joe Biden and the EU, will cause an acceleration of the global energy transition. These programmes also satisfy the immediate post COVID government and social needs on a number of levels, including:

- **Employment** investment in low carbon infrastructure tends to be more capital-intensive and local economy/employee-intensive than traditional energy developments. A recent analysis by the International Renewable Energy Agency (IRENA) estimated that 40m jobs could be created in the area globally by 2050.
- **Economic materiality** the same analysis estimates that investments in the energy transition could have a 5x multiplier effect on GDP.
- **Climate change** leading the world to reduce carbon emissions via cleaner energy
- **Interest rate sensitive** low carbon infrastructure projects require greater upfront capital (and have lower operating costs) so they are more sensitive to the cost of financing. They are more likely to benefit relative to conventional projects in the post-COVID ultra low interest rate environment.

These are good reasons in our opinion for clean energy projects to represent potentially attractive public-private partnerships that are pro-growth that also provide long term clean, sustainable and competitive energy for the future.

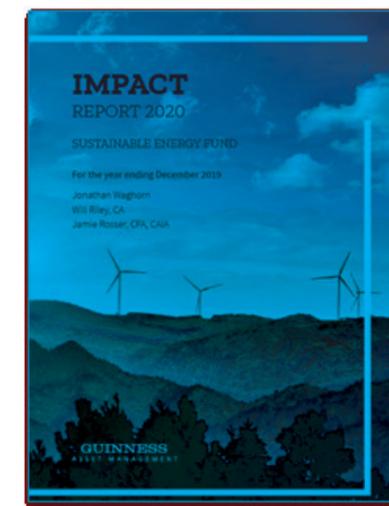
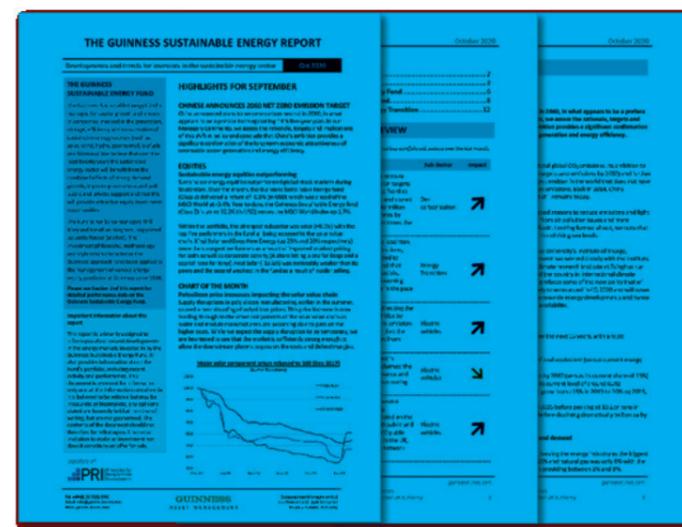


With a long history of investing in the themes of both ‘energy’ and ‘alternative energy’, Guinness Asset Management has built both a strong record as well as long body of experience in these areas.

In 2018 we re-positioned our ‘Guinness Sustainable Energy Fund’. The moment seemed right to focus on an area where seismic changes were occurring in the patterns of production and consumption. These offered investors the opportunity both to capitalise upon, and encourage, these move towards a lower carbon energy economy. In recognition of the fact that “sustainability” was increasingly being viewed as mainstream within investment we also took the decision to benchmark the fund against the broader MSCI World Index

In the two years since launch the strategy has proved extremely popular with investors and is growing fast, having now reached more than \$200m in terms of assets under management. It has also performed strongly relative to both its competitors and the broad index.

Guinness produces regular white papers and updates on the strategy. If you would like to know more contacts us. [Click here to read the managers’ latest investment commentary on the Fund.](#)



IMPORTANT INFORMATION

The Guinness Sustainable Energy Fund is an equity fund. Investors should be willing and able to assume the risks of equity investing. Investment in the Funds carries with it a degree of risk and investors should read the risk factors section in the prospectus before investing.

Past performance is not a guide to the future. The value of this investment and any income arising from it can fall as well as rise. This will be as a result of market, currency and exchange rate fluctuations as well as other factors both directly and indirectly related to the stocks in which it is invested.

Shareholders should note that all or part of the fees and expenses will be charged to the capital of the Fund. This will have the effect of lowering the capital value of your investment.

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The full Fund documentation contains more complete and detailed information of risk, fees, charges and expenses that are to be borne by an investor. The documentation should be read carefully before investing. The full documentation needed to make an investment, including the Prospectus, the KIID and the Application Form are available, free of charge, from the Manager: Link Fund Manager Solutions (Ireland) Ltd, 2 Grand Canal Square, Grand Canal Harbour, Dublin 2, Ireland or the Promoter and Investment Manager: Guinness Asset Management Ltd, 18 Smith Square, London SW1P 3HZ. Documentation is also available from the website: guinnessfunds.com.

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The paying agent is Banque Cantonale de Genève, 17 Quai de l'Île, 1204 Geneva, Switzerland.